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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,225	10/15/2003	Xiaohui Qin	10030377-1	8105

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AGILENT TECHNOLOGIES, INC.
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EXAMINER

NORRIS, JEREMY C

ART UNIT	PAPER NUMBER
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2841

DATE MAILED: 03/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

ET

Office Action Summary	Application No. 10/687,225	Applicant(s) QIN ET AL.	
	Examiner Jeremy C. Norris	Art Unit 2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 8-14 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,583,468 (Kielmeyer).

Kielmeyer discloses, referring primarily to figures 1-5, an electrical interconnection comprising: a first planar transmission device (11) having a first conductive region (18) with a first edge; a second planar transmission device (56) having a second conductive region (44) with a second edge, the second edge being offset from the first edge (figures 1,4); and a bond wire (38) coupled to the first edge with a first bond and to the second edge with a second bond [claim 1], wherein the first conductive region is a first center conductor of a first planar transmission line, the second conductive region is a second center conductor of a second planar transmission line, and the electrical interconnection further comprises a first opposite edge of the first center conductor; a second opposite edge of the second center conductor; and a second bond wire (39) coupled to the first opposite edge with a third bond and to the second opposite edge with a fourth bond [claim 2], wherein the first opposite edge is offset from the second opposite edge (figures 1, 4) [claim 3], wherein the first center conductor is wider than the second center conductor (figure 4) [claim 4], wherein the

first planar transmission device is a first microstrip transmission line and the second planar transmission device is a second microstrip transmission line [claim 8], wherein the first planar transmission device is a first slot line and the second planar transmission device is a second slot line [claim 10], wherein the second planar transmission device comprises an integrated circuit (col. 6, lines 10-20) and further comprising: a second bond wire (39) coupled to an opposite edge of the first conductive region with a third bond and to the second conductive region with a fourth bond [claim 11].

Alternately, Kielmeyer discloses, referring primarily to figure 4, an electrical interconnection comprising: a first planar transmission device (11) having a first conductive region with a first edge (51); a second planar transmission device (56) having a second conductive region (42) with a second edge, the second edge being offset from the first edge (figures 1,4); and a bond wire (38) coupled to the first edge with a first bond and to the second edge with a second bond [claim 1], wherein the first conductive region is a first ground plane of a first co-planar transmission line (col. 7, lines 60-65) and the second conductive region is a second ground plane of a second co-planar transmission line (col. 7, lines 60-65) [claim 9]

Similarly, Kielmeyer discloses, referring primarily to figures 4 & 5, an electrical interconnection comprising: a first planar transmission device (56) having a conductive region (44) with a first edge and a second edge; a component (11); a first bond wire (38) coupled to a first edge with at least a first ball bond (figure 5) and to the component with a first end bond; and a second bond wire (39) coupled the second edge with at least a second ball bond (figure 5) and to the component with a second end bond [claim 12],

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wherein the first planar transmission device is a planar transmission line and the conductive region is a center conductor of the planar transmission line (col. 6, lines 10-20) [claim 13], wherein the component is a second planar transmission line having a second center conductor (col. 7, lines 40-60), the first bond wire being coupled to a first edge (47) of the second center conductor, and the second bond wire being coupled to a second edge (48) of the second center conductor [claim 14].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5-7, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kielmeyer in view of JP 2003-86621 (Rohm).

Kielmeyer discloses the claimed invention as described above except Kielmeyer does not specifically state that the first bond includes a ball bond and an intermediate bond, the intermediate bond being closer to the first edge than the ball bond [claim 5]. However, it is well known in the art to include an intermediate (stitch) bond and a ball bond when wire bonding to a conductor as evidenced by Rohm ([0012]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include an intermediate (stitch) bond and a ball bond in the first bond in the invention of Kielmeyer as is known in the art and evidenced by Rohm. The motivation for doing so would have been to increase stability of the bond, thus increasing the reliability of the device (Rohm [0013]). Moreover, though, the modified invention of Kielmeyer does not specifically teach the intermediate bond being closer to the first edge than the ball bond, Rohm teaches locating the intermediate (stitch) bond in a location which optimizes the loop height of the wire bond ([0017]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form the intermediate bond closer to the first edge than the ball bond in the modified invention of Kielmeyer as taught by Rohm. The motivation for doing so would have been to optimize the loop height of the wire bond and thus increase the reliability of the device. Moreover, it has

been held that where the general conditions of a claim are disclosed in the prior art, discovering that optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Similarly, regarding claim 6, Kielmeyer discloses the claimed invention as described above except Kielmeyer does not specifically state that the first bond includes a first ball bond and a first intermediate bond, and the third bond includes a second ball bond and a second intermediate bond, the first ball bond being closer to an end of the first center conductor than the second ball bond [claim 6]. However, it is well known in the art to include an intermediate (stitch) bond and a ball bond when wire bonding to a conductor as evidenced by Rohm ([0012]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include an intermediate (stitch) bond and a ball bond in the first and third bonds in the invention of Kielmeyer as is known in the art and evidenced by Rohm. The motivation for doing so would have been to increase stability of the bonds, thus increasing the reliability of the device (Rohm [0013]). Moreover, though, the modified invention of Kielmeyer does not specifically teach the intermediate bonds being closer to the first edge than the ball bond, Rohm teaches locating the intermediate (stitch) bond in a location which optimizes the loop height of the wire bond ([0017]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form the intermediate bonds closer to the end than the ball bond in the modified invention of Kielmeyer as taught by Rohm. The motivation for doing so would have been to optimize the loop height of the wire bond and thus increase the reliability of the device. Moreover,

it has been held that where the general conditions of a claim are disclosed in the prior art, discovering that optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Additionally, the twice modified invention of Keilmeyer teaches wherein the first center conductor has a width less than or equal to twice a bond target width (figure 1) [claim 7].

Also, regarding claim 16, Keilmeyer discloses the claimed invention as described above except Keilmeyer does not specifically state a first intermediate bond coupling the first bond wire to the first edge [claim 16]. However, it is well known in the art to include an intermediate (stitch) bond and a ball bond when wire bonding to a conductor as evidenced by Rohm ([0012]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include an intermediate (stitch) bond and a ball bond in the first and third bonds in the invention of Keilmeyer as is known in the art and evidenced by Rohm. The motivation for doing so would have been to increase stability of the bonds, thus increasing the reliability of the device (Rohm [0013]). In addition the modified invention of Keilmeyer does not specifically teach the intermediate bonds being closer to the first edge than the ball bond. Rohm teaches locating the intermediate (stitch) bond in a location which optimizes the loop height of the wire bond ([0017]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form the intermediate bonds closer to the end than the ball bond in the modified invention of Keilmeyer as taught by Rohm. The motivation for doing so would have been to optimize the loop height of the wire bond and thus increase the reliability of the device. Moreover, it has been held that where the

general conditions of a claim are disclosed in the prior art, discovering that optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Similarly, regarding claim 18, Kielmeyer discloses the claimed invention as described above except Kielmeyer does not specifically state that the first bond includes a first ball bond and a first intermediate bond, and the third bond includes a second ball bond and a second intermediate bond, the first ball bond being closer to an end of the first center conductor than the second ball bond [claim 18]. However, it is well known in the art to include an intermediate (stitch) bond and a ball bond when wire bonding to a conductor as evidenced by Rohm ([0012]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include an intermediate (stitch) bond and a ball bond in the first and third bonds in the invention of Kielmeyer as is known in the art and evidenced by Rohm. The motivation for doing so would have been to increase stability of the bonds, thus increasing the reliability of the device (Rohm [0013]). Moreover, though, the modified invention of Kielmeyer does not specifically teach the intermediate bonds being closer to the first edge than the ball bond, Rohm teaches locating the intermediate (stitch) bond in a location which optimizes the loop height of the wire bond ([0017]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form the intermediate bonds closer to the end than the ball bond in the modified invention of Kielmeyer as taught by Rohm. The motivation for doing so would have been to optimize the loop height of the wire bond and thus increase the reliability of the device. Moreover, it has been held that where the general conditions of a claim are disclosed in the prior

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art, discovering that optimum or workable ranges involves only routing skill in the art. *In re Aller*, 105 USPQ 233.

Claims 12, 13, 15, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kielmeyer in view of JP 55-118643 (Kenji).

Kielmeyer discloses, in an alternate interpretation regarding claim 12, referring primarily to figure 4, an electrical interconnection comprising: a first planar transmission device (11) having a conductive region with a first edge (47) and a second edge (48); a component (56); a first bond wire (38) coupled to a first edge with at least a first bond and to the component with a first end bond; and a second bond wire (39) coupled the second edge with at least a second bond (figure 5) and to the component with a second end bond. Kielmeyer does not specifically state that the first and second bonds are ball bonds [claim 12]. However, it is well known in the art to form each of the end bonds of a wire bond connection with a ball bond as evidenced by Kenji (figure 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form ball bonds at each end of the wire bonds in the invention of Kielmeyer as is known in the art as evidenced by Kenji. The motivation for doing so would have been to equalize the heights of the ends and thus increase the strength of the bonds (Kenji, abstract).

Additionally, the modified invention of Kielmeyer teaches wherein the first planar transmission device is a planar transmission line and the conductive region is a center conductor of the planar transmission line (col. 7, lines 40-50) [claim 13], wherein the

component is an integrated circuit (col. 8, lines 20-35) [claim 15], wherein the component is a second planar transmission line having a second center conductor (44) narrower than the center conductor [claim 19].

Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kielmeyer in view of US 6,548,893 (Chen).

Kielmeyer discloses the claimed invention as described above except Kielmeyer does not specifically disclose that the first planar transmission device is a first coplanar strip line transmission structure having a first center conductor and a second center conductor and the component is a second coplanar strip line transmission structure having a third center conductor and fourth center conductor [claim 20]. However, it is well known in the art to provide multiple microstrip lines in transmission structures as evidenced by Chen (col. 2, lines 25-45). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include a second conductor on the first device and a fourth conductor on the second device in the invention of Kielmeyer as is known in the art and evidenced by Chen. The motivation for doing so would have been to allow for the simultaneous transmission of shielded signals. Moreover, it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Similarly, regarding claim 21, Kielmeyer discloses, referring primarily to figure 4, an electrical interconnection comprising: a first transmission device (11) having a first

center conductor with a first edge (47) and a first opposite edge (48) a second transmission structure having a third center conductor (44) with a third edge and a third opposite edge; a first bond wire (38) coupling the first edge to the third edge; a second bond wire (39) coupling the first opposite edge to the third opposite edge. Kielmeyer discloses the claimed invention as described above except Kielmeyer does not specifically disclose that the first planar transmission device is a first coplanar strip line transmission structure having a first center conductor and a second center conductor and the component is a second coplanar strip line transmission structure having a third center conductor and fourth center conductor [claim 20]. However, it is well known in the art to provide multiple microstrip lines in transmission structures as evidenced by Chen (col. 2, lines 25-45). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include a second conductor on the first device and a fourth conductor on the second device in the invention of Kielmeyer as is known in the art and evidenced by Chen. The motivation for doing so would have been to allow for the simultaneous transmission of shielded signals. Moreover, it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. Additionally, the modified invention of Kielmeyer does not specifically teach a third bond wire coupling the second edge to the fourth edge; and a fourth bond wire coupling the second opposite edge to the fourth opposite edge. However, since Kielmeyer teaches this arrangement for connecting the first and third conductors (figure 4), it would have been obvious to one having ordinary skill in the art at the time of invention to similarly connect

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the second and fourth conductors with bonding wires as shown in figure 4. The motivation for doing so would have been to provide a low loss means of coupling the two devices (Kielmeyer col. 8, lines 20-35). Additionally, the modified invention of Kielmeyer teaches, wherein the second transmission structure comprises an integrated circuit (col. 8, lines 25-35) [claim 22].

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following documents disclose wire bonded substrates:

US 4,686,492 Grellmann et al.,

US 6,784,090 B2 Fujihara.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCSN



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